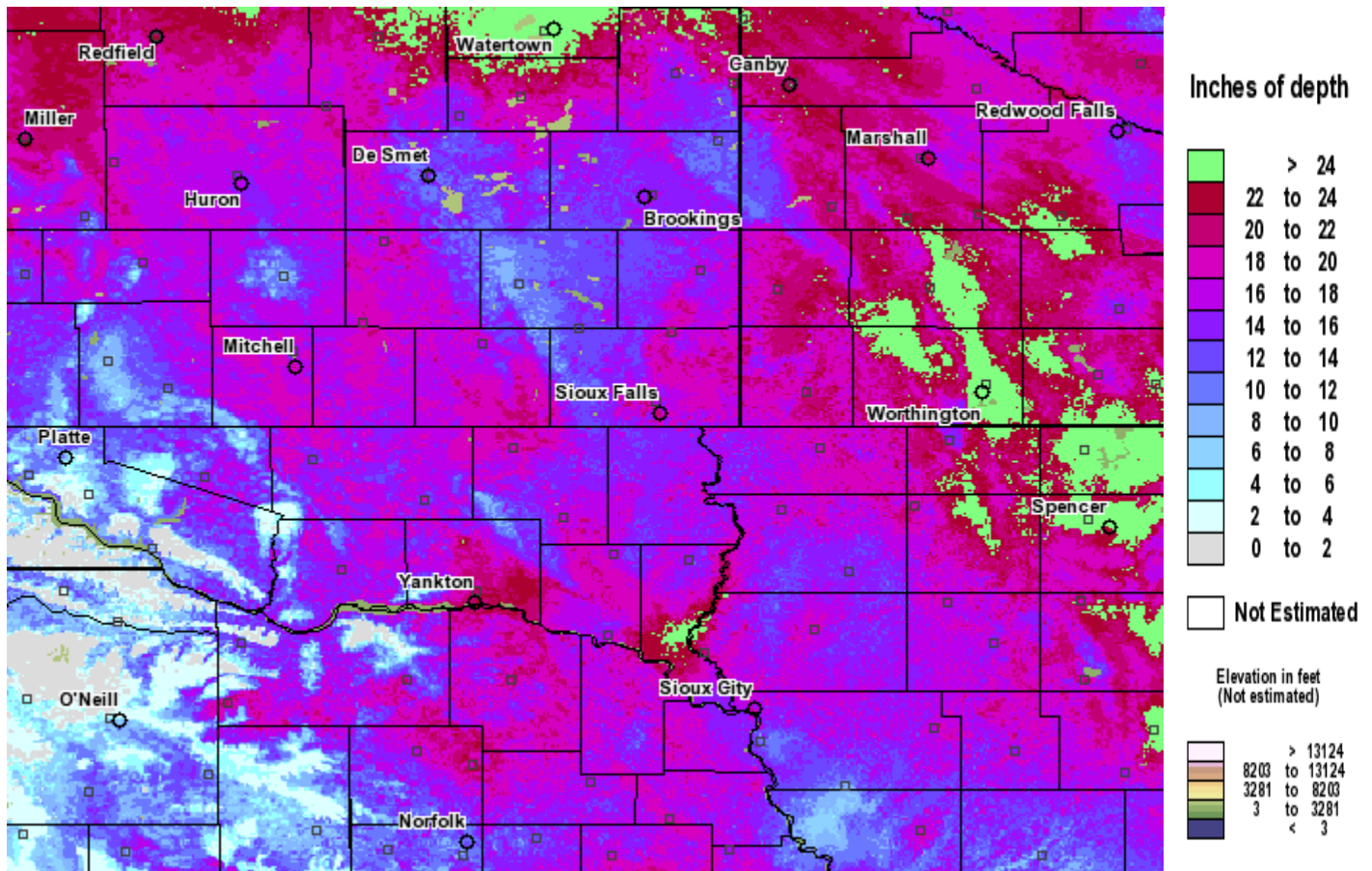


Snowmelt Flood Outlook

3/5/2010

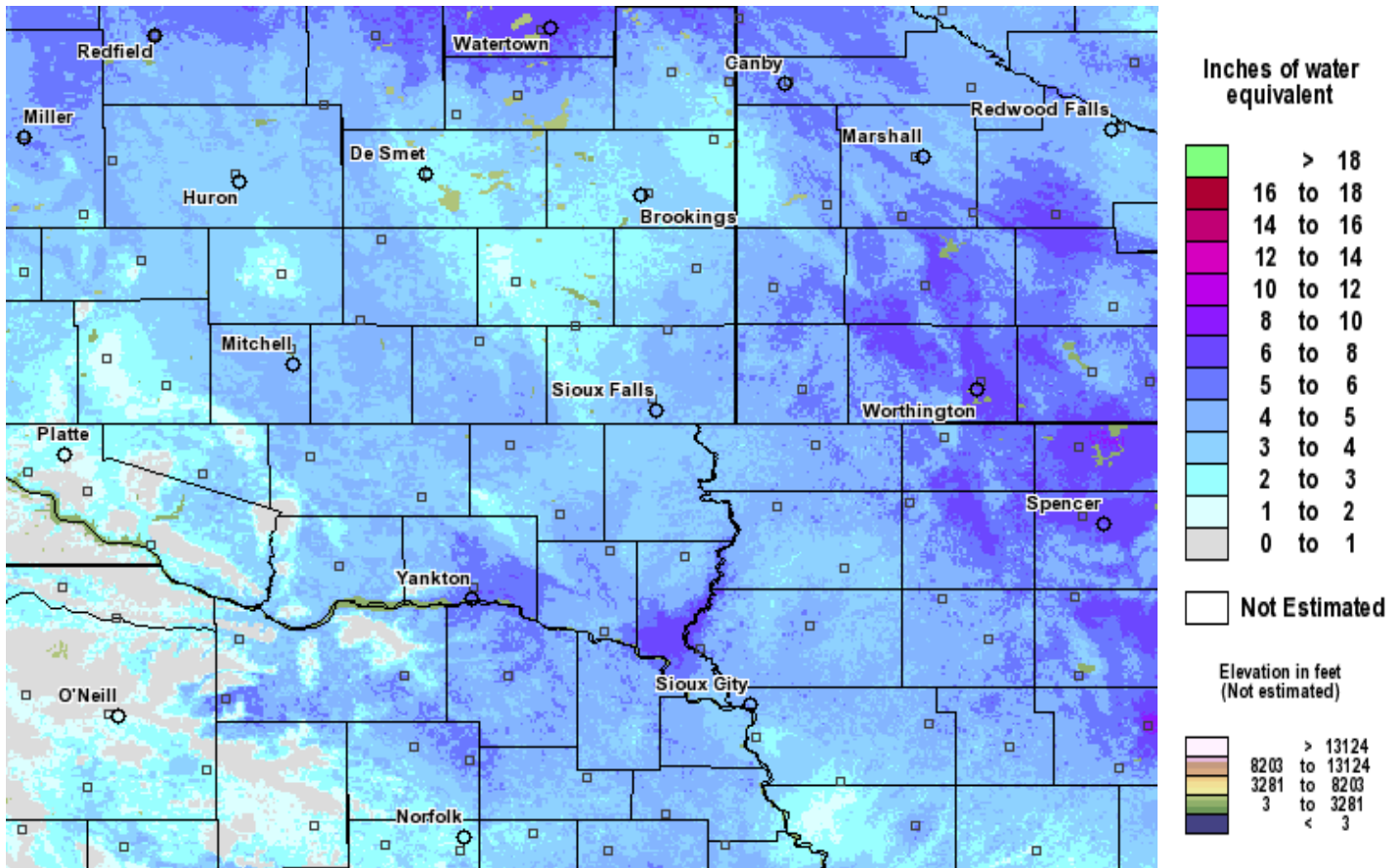
Current Conditions:

Snow Depth



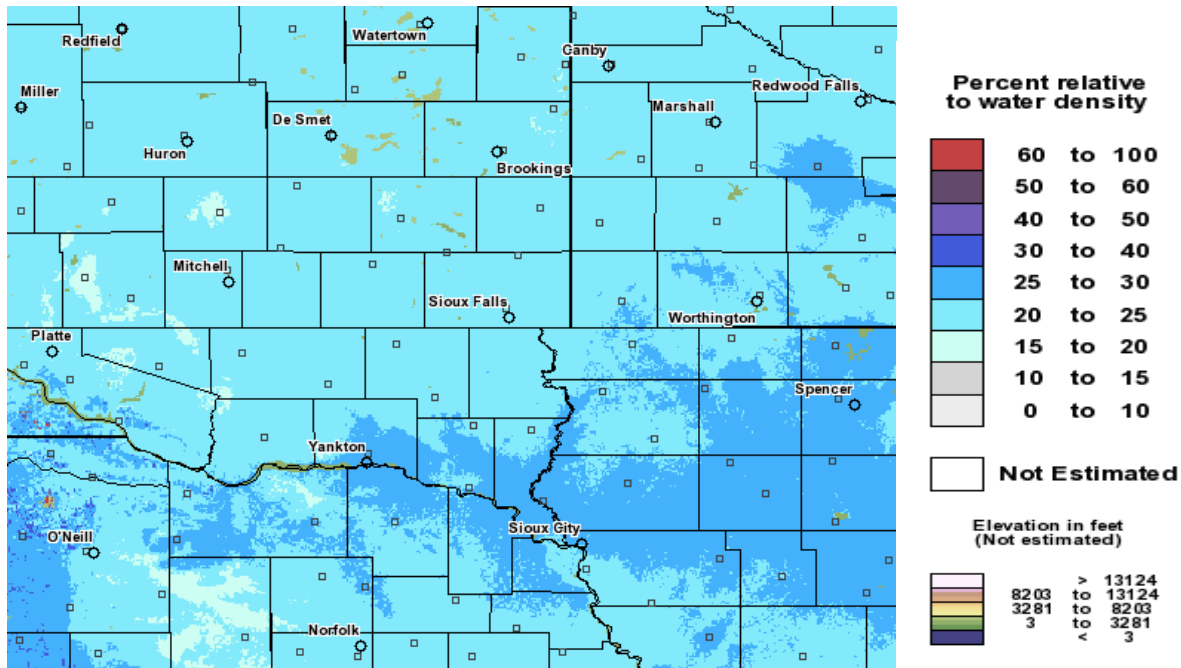
Snow depths are generally in the 10 to 20 inch range across the region. Parts of the upper Big Sioux and upper James basins, as well as areas along the Buffalo Ridge and the Iowa Lakes region have snow depths of 20 to 30 inches.

Snow Water Equivalent



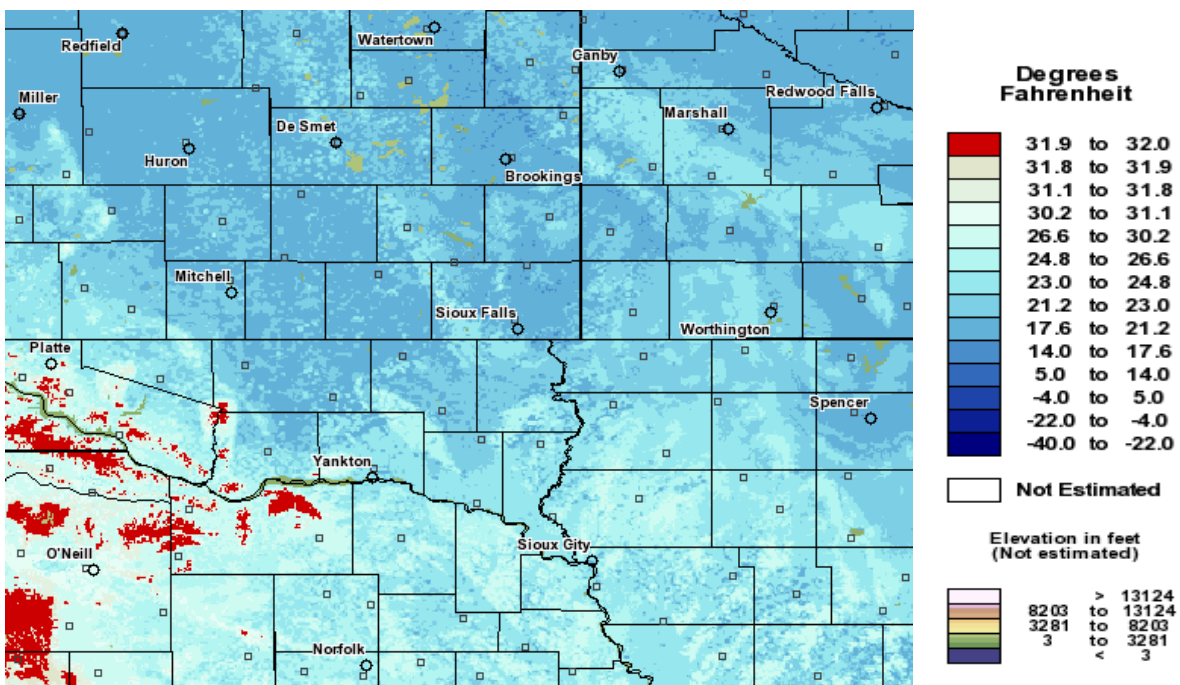
Snow Water Equivalent values are generally in the 2 to 4 inch range. Areas with amounts of 4 to 6 inches can be found in parts of southwest Minnesota and northwest Iowa, as well as isolated spots in the lower Vermillion and Big Sioux basins.

Snow Density

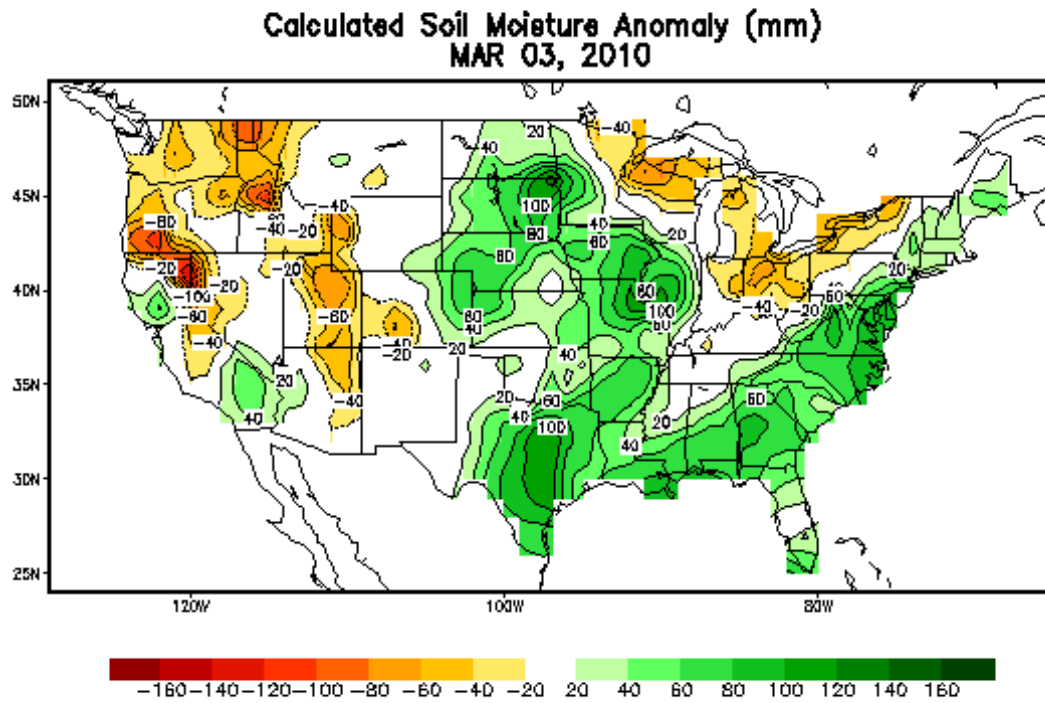


With the warmer temperatures and the stronger sunlight in the past couple weeks, there has been some melting/compaction of the snowpack. However, the snow density (snow/water ratio) is still low enough that very little to no water has begun running out of the snow pack as of yet. Snowmelt runoff normally will begin when snow densities exceed about 40%, and from the image above, it can be seen that the densities are still in the 20 to 30 percent range across the region. The image below shows the current average temperature of the snow pack. Large scale snow melt will usually begin once the average temperature approaches 30 degrees.

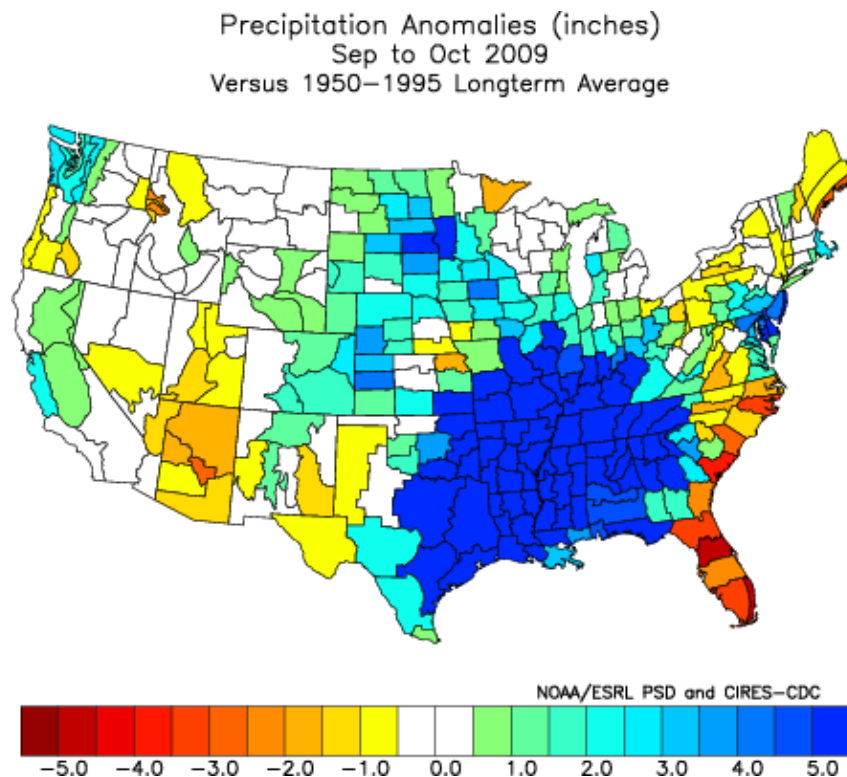
Snowpack Temperature



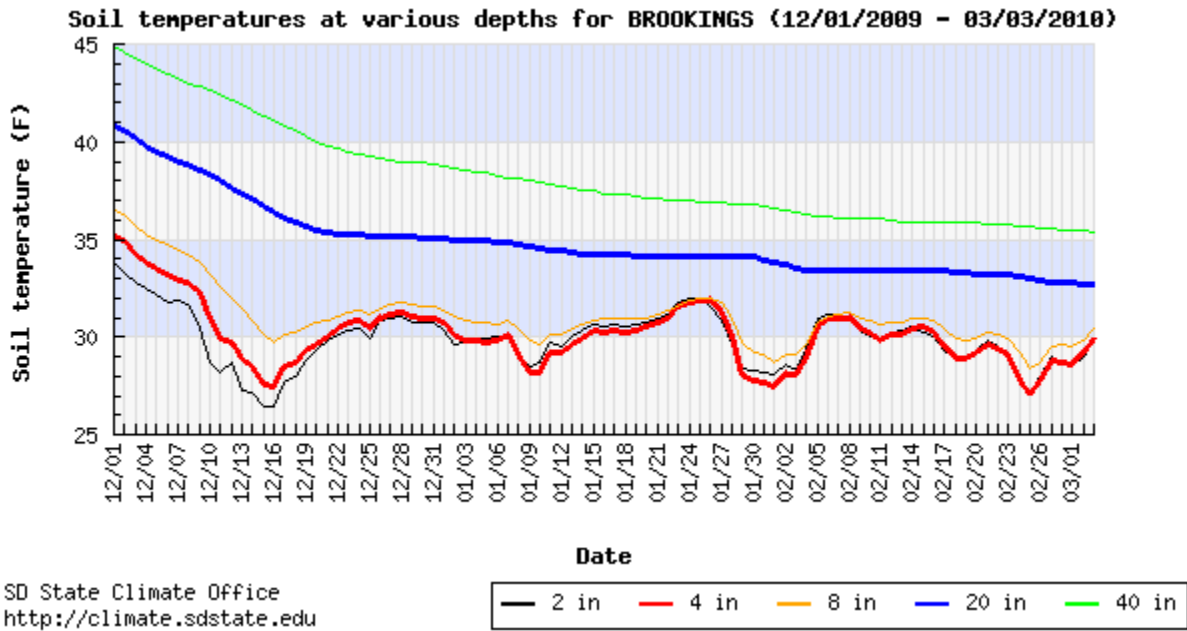
SOIL CONDITIONS



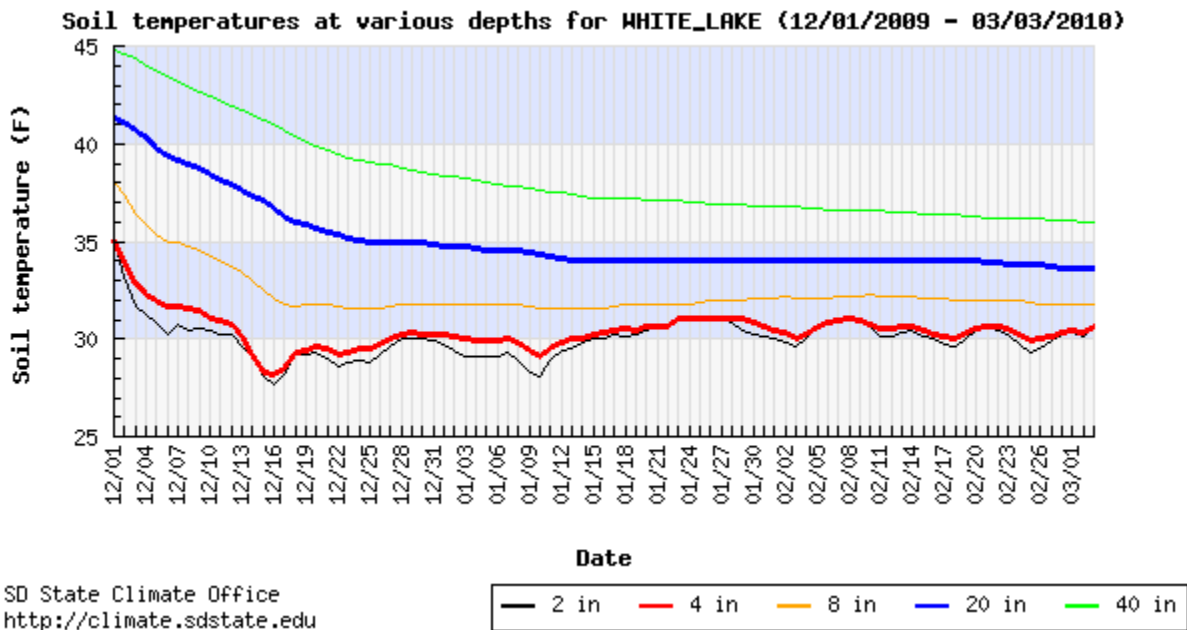
The soil moisture is roughly 2 to 5 inches above normal, with the wettest areas being in the James River basin and northeastern South Dakota. Most of the surplus soil moisture is a result of the above normal precipitation in September and October (see image below).



Soil Temperature

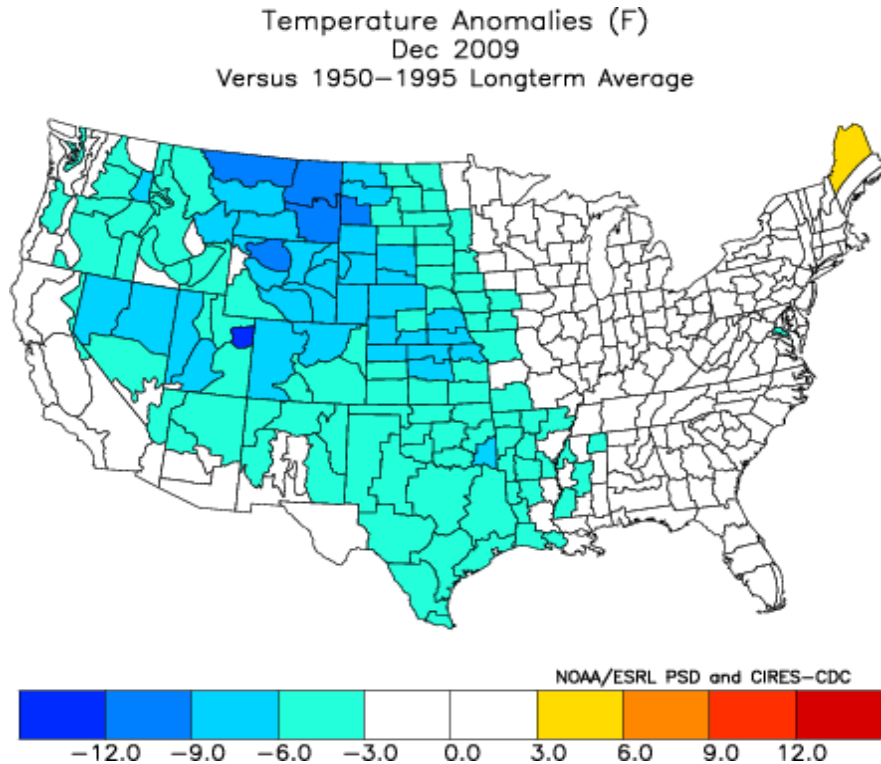


These images show the soil temperatures at various depths since December 1, 2009. The image above is for the Brookings area, and the image below is for the White lake area. It can be seen that the soils are well frozen (30 degrees or less) to a depth of greater than 8 inches at Brookings, but are barely at or below freezing (30-32 degrees) at those same depths at White Lake. Neither location is frozen at the 20 inch depth. Most of the region has frost depths of 8 inches or less. This is due to the blanketing snow cover that occurred in early December before the soils had a chance to freeze to any significant depths.



Ice Conditions:

Due to the above normal rains last Fall, water levels in eastern South Dakota, northwestern Iowa, and southwestern Minnesota were much above normal heading into the Winter. Then with the below normal temperatures for the winter, thick and solid ice has formed on the rivers and streams across the entire state.



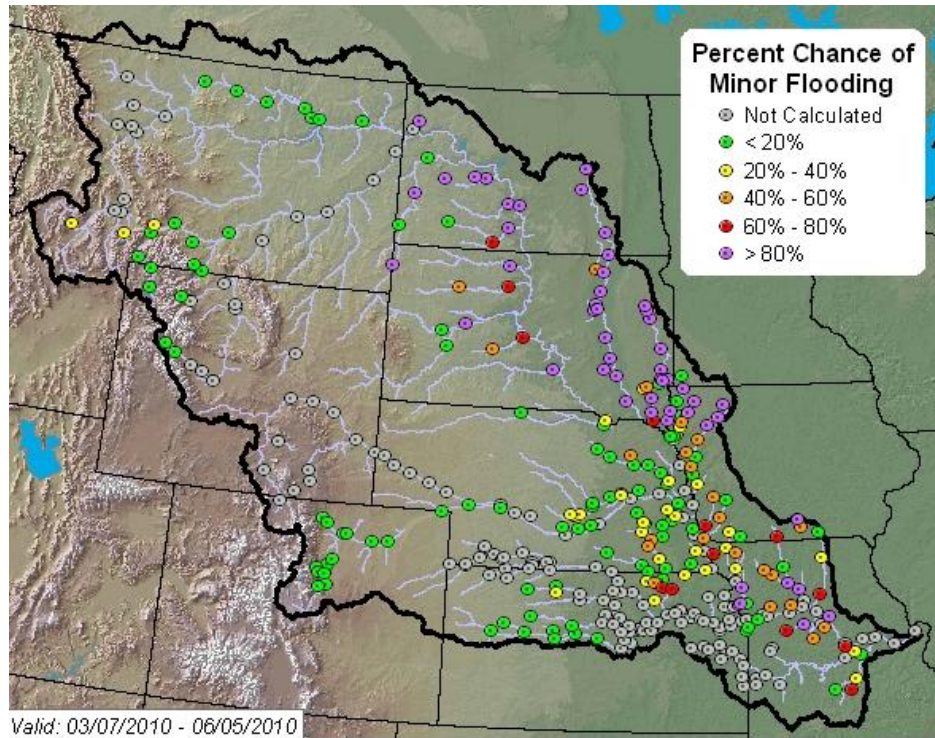
This will greatly increase the threat for significant ice jams through the rest of March. The parts of the region that normally see the worst ice jams are:

- The rivers and streams east of the Buffalo Ridge that flow from west to east. Usually the western parts of the basins warm up faster than the east, so flows will increase and the river ice will break up in the upstream areas first, and this ice will not be able to flow freely downstream due to the more solid ice pack to the east.
- The Missouri River downstream of Gavins Point Dam and also between Fort Randall Dam and Lewis and Clark Lake. Reservoir operations through the winter months will usually result in the formation of an ice-bridge above the current river level. When the river begins rising due to either increased releases or increased tributary flow, this ice will break up into large chunks if significant melting has not occurred to the bridge.
- The Vermillion River in Turner and Clay counties in southeastern South Dakota. This section of the river is very winding with numerous tributaries.

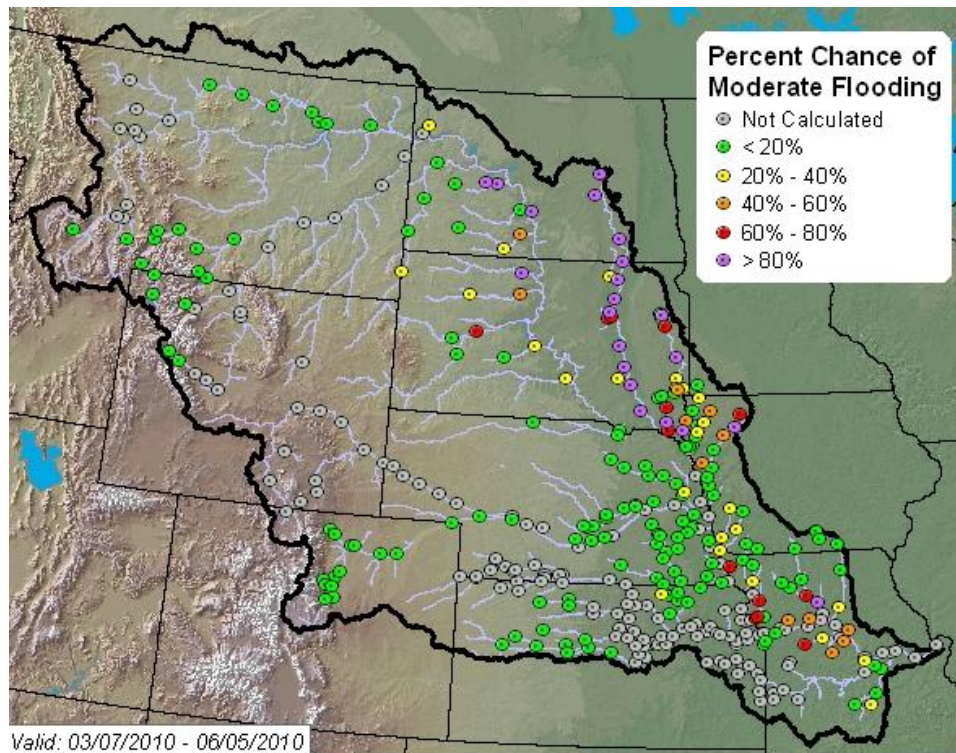
Any river or stream could see ice jams. These will generally occur where there are sharp bends in the river, or where there is an obstruction to the flow such as bridges. Another favorite location for ice jams is near where tributaries flow into a larger stream or river. The ice and water coming into the larger body from the smaller one will often produce more ice in the main river or stream than can pass through due to existing ice on the larger body. Water levels can quickly rise by several feet upstream of the ice jams, and decrease by similar amounts downstream of the jam. When these jams give way, rapid rises in water levels will be experienced downstream which could trigger Flash Flood warnings if conditions warrant.

Probabilistic Flood Outlook

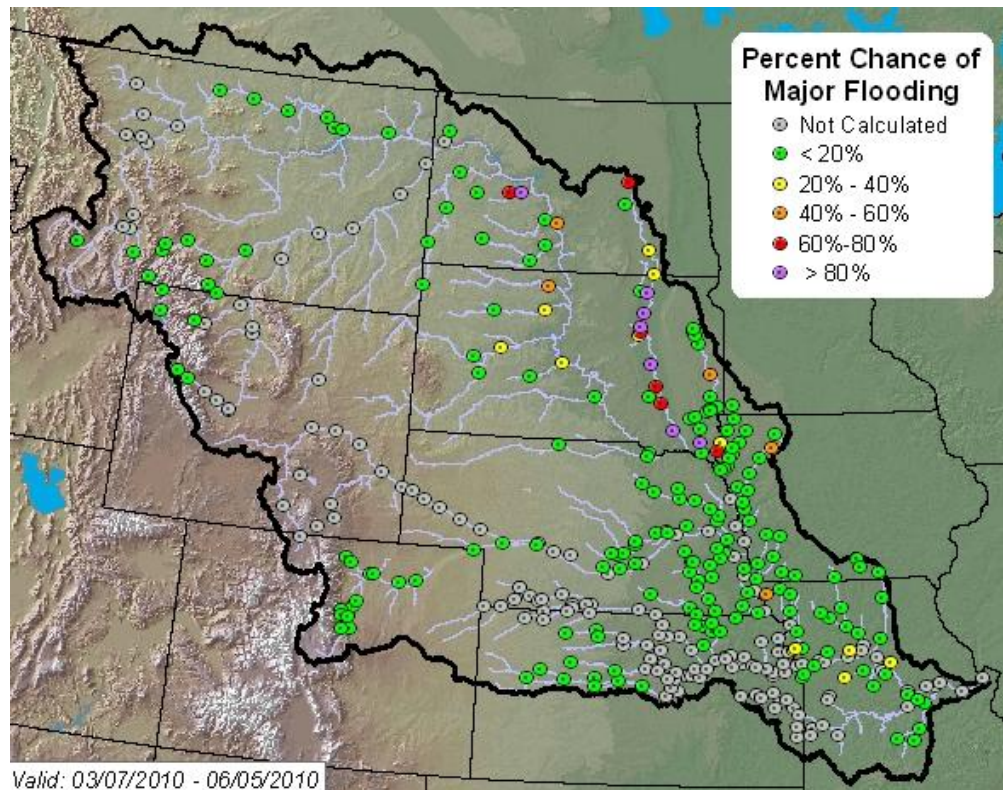
The following outlooks only account for flooding due to snow melt and does not account for any flooding due to ice jams.



In the above image, it can be seen that there is a greater than 80% chance of minor flooding for nearly all of the James, Vermillion, Big Sioux, Floyd, and Little Sioux Basins.



In this image, it shows that there is a greater than 80% chance of moderate flooding on the entire James River, as well as parts of the Vermillion, Big Sioux, and Little Sioux rivers.



This image shows that there is a 60-80+ percent chance of major flooding on the James River, as well as the lower Vermillion and lower Big Sioux rivers.

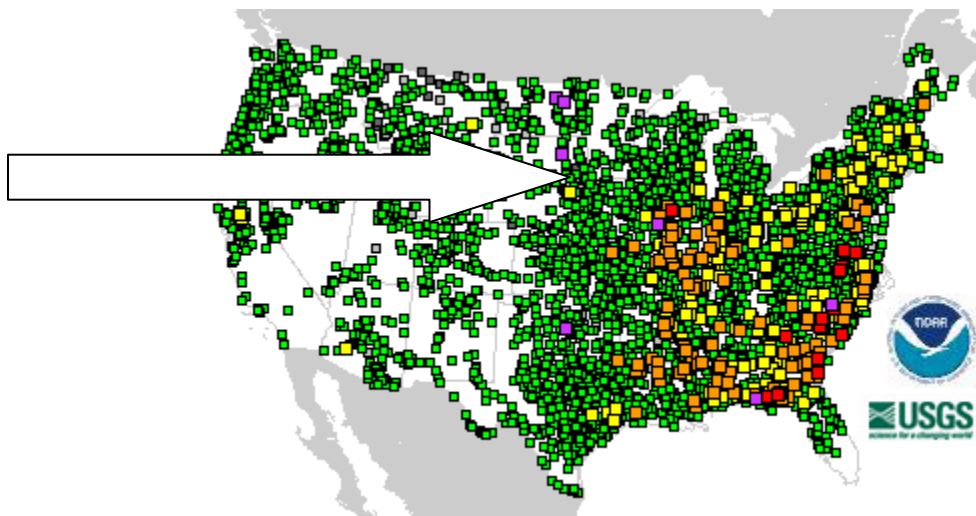
AREAL FLOODING THREATS: more widespread areal flooding or ponding of water will also be likely across the region. Sloughs, ponds, and lakes will experience significant rises that could threaten some secondary roads.

Probabilistic Outlooks for individual River Gages:

To access the latest 90-day probabilistic information for a specific gage, please follow these instructions.

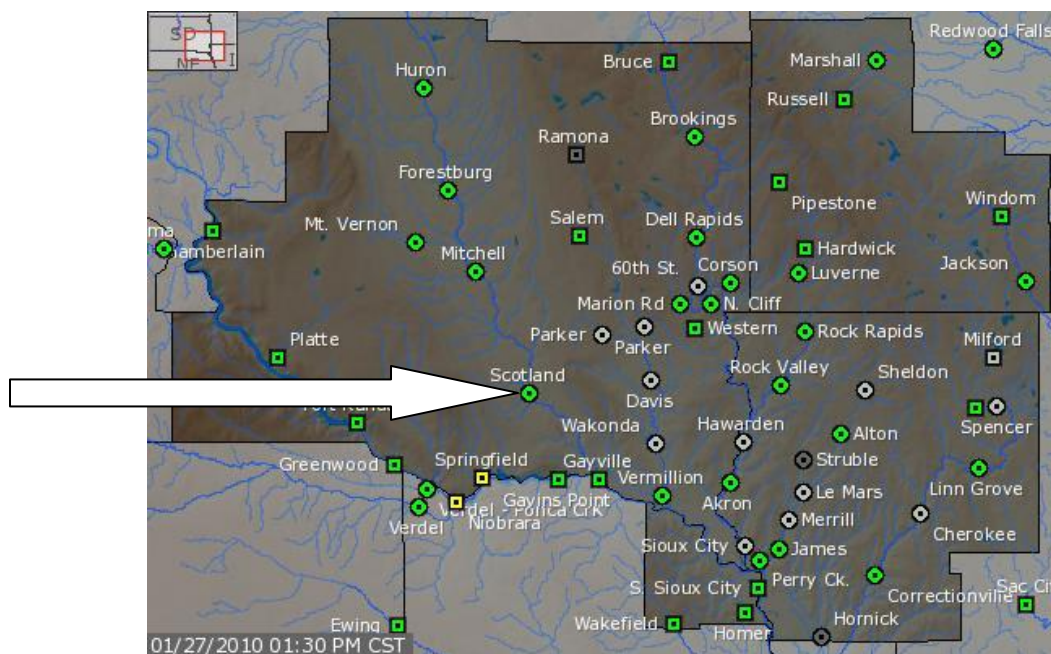
(Note: The URL addresses for the AHPS pages will be changing on 3/16/2010. Information about these changes can be found at: http://www.crh.noaa.gov/ahps2/URL_Changes_for_web_page_updated.pdf).

- Start at the main AHPS web page at <http://www.weather.gov/ahps/>



- Click on the area you want on the main map. For this example I will use FSD at:

<http://www.crh.noaa.gov/ahps2/index.php?wfo=fsd&view=1,1,1,1,1,1,1,1&toggles=10,7,8,2,9,15,6>



- Click on the Green (or Gray) Dot for the station you want to see. For this example, I will use the James River at Scotland at:

<http://www.crh.noaa.gov/ahps2/hydrograph.php?wfo=fsd&gage=scos2&view=1,1,1,1,1,1,1,1>

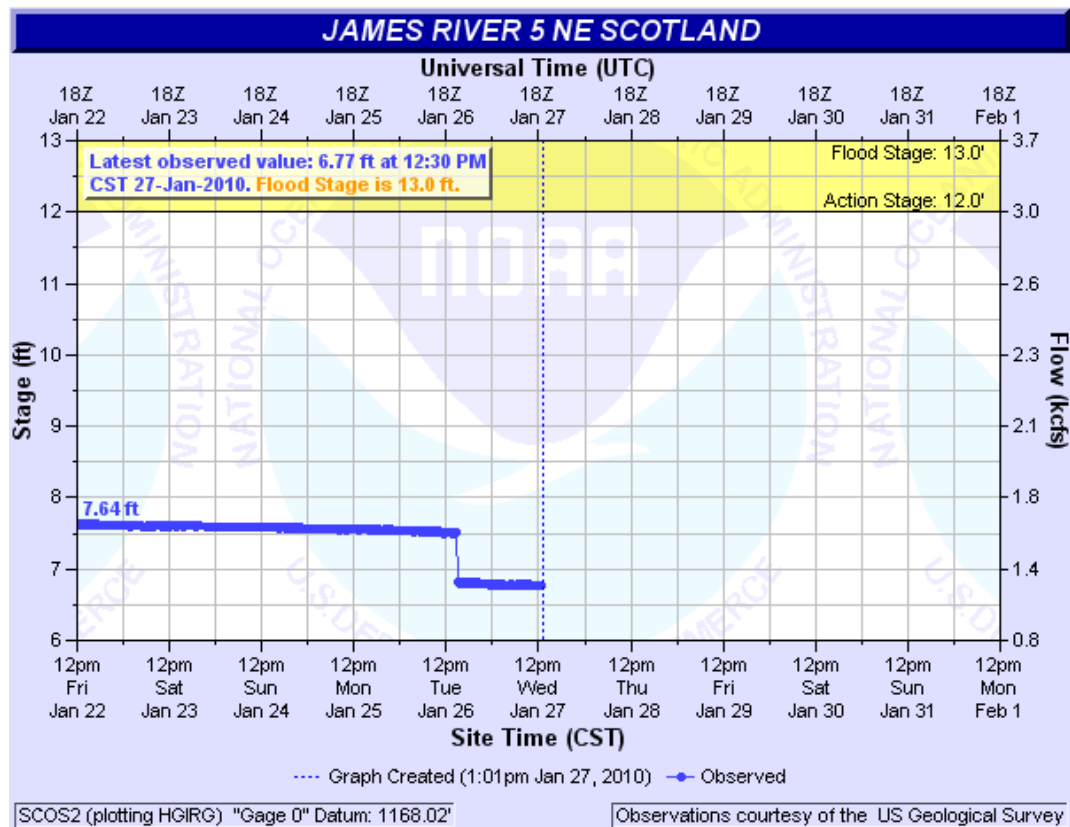
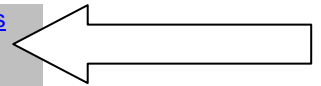
Hydrograph

[River at a Glance](#)

[Download](#)

[Weekly Chance of
Exceeding Levels](#)

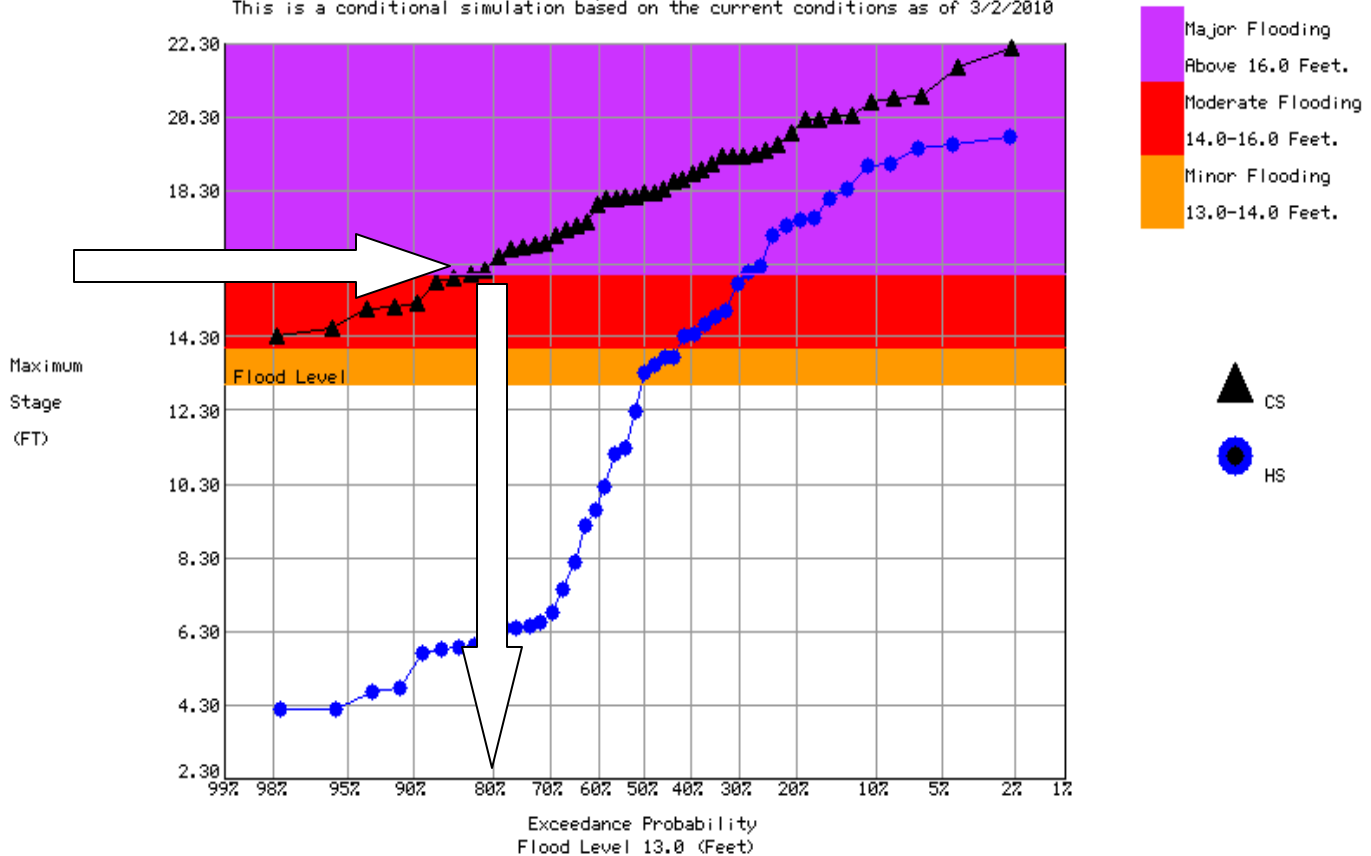
[Chance of Exceeding Levels
During Entire Period](#)



- Click on the “Chance of Exceeding Levels During Entire Period” tab above the hydrograph. This will bring up the latest 90-day probabilistic graphic:

<http://www.crh.noaa.gov/ahps2/period.php?wfo=fsd&gage=scos2&view=1,1,1,1,1,1,1,1&toggles=10,7,8,2,9,15,6>

Chances of Exceeding River Levels on the JAMES R +195 at SCOTLAND SD \$
 Latitude: 43.2 Longitude: 97.6
 Forecast for the period 3/7/2010 - 6/5/2010
 This is a conditional simulation based on the current conditions as of 3/2/2010



Interpreting the above graphic: The **BLUE** line gives the historically observed chances of hitting different stages. The **BLACK** line gives the probabilities in the next 90 days based on the current conditions. If the black line is to the left of the blue line, that means there is a higher chance of hitting that stage than normal. To get the expected probability of hitting Major Flooding, start on the left side of the image where the **RED** and **PURPLE** areas meet. Follow along this line to the right until you hit the **BLACK** line, then follow that down to the bottom to read the Percentage Probability.

The text products of the Flood Outlooks covering South Dakota can be found at the following links:

SIOUX FALLS (FSD)

<http://www.crh.noaa.gov/product.php?site=FSD&product=ESF&issuedby=FSD&format=txt>

ABERDEEN (ABR)

<http://www.crh.noaa.gov/product.php?site=FSD&product=ESF&issuedby=ABR&format=txt>

RAPID CITY (UNR)

<http://www.crh.noaa.gov/product.php?site=FSD&product=ESF&issuedby=UNR&format=txt>